NEW YORK, DECEMBER 20, 1921, No. 101

Published to advance the Science of cold-blooded vertebrates

THE FOOD OF *Mustelus canis* (Mitchill) IN MID-SUMMER

The following notes were made from the examination of the stomach contents of 102 specimens of *Mustelus canis* (Mitchill) taken at Atlantic City, N. J., between August 5 and 17, 1920, in the pound nets operated from Young's Pier. They varied in length from 30 to 64 cm., the model length being 38 cm., although only a few reached near the upper limit, and except in the largest specimens, the gonads were undeveloped. The following data indicates the number of stomachs containing each constituent of food:—

Material:—Fish, no. of stomachs, 10. Crabs, 44. Unidentified crustaceans, 4. *Nereis* sp., 1. Univalves, 3. Eel Grass, 24. Various Sea Weeds, 5. Debris, 21.

Among the fish remains were two swim-bladders of large fish, which were very likely picked out of the refuse from vessels. A specimen of *Fundulus heteroclitus macrolepidotus* (Walbaum) about 6 cm. long was taken from a 37 cm. *Mustelus*. The crabs were mostly of small non-commercial species, although parts of a few Blue Crabs were found in some.

The vegetable content was possibly accidental, it being ingulfed along with the small invertebrates

which are so often found among marine vegetation. A piece of bark, which appeared to be of an oak, was found in one stomach. Several fish contained considerable gas in their alimentary tract. This could not have been due to mortification as the specimens were examined on capture. It was probably generated by the processes of digestion.

C. M. Breder, Jr.,
U. S. Bureau of Fisheries.

NOTES ON A POSTLARVAL SCIAENOID FISH WITH THREE ANAL SPINES

A young specimen of the common Californian sciaenoid, *Genyonemus lineatus* Ayres, 34 mm. long to caudal, found dead on the beach at Montecito, on the mainland shore of the Santa Barbara Channel, on July 12, 1916, has three unquestionable anal spines: the third is small, and apparently characteristic only of the young, disappearing with age (a young *Seriphus politus* from Laguna Beach, California, 52 mm. long, taken on December 27, 1914, has only two anal spines). The entire family Sciaenidae is currently characterized by "the presence of never more than two anal spines," but the Haemulidae, probably ancestral to the Sciaenidae, normally possess three anal spines, the number typical of most Acanthopterygii.

This young individual further differs widely from the adult in not having the posterior dorsal spines greatly shortened, the lowest being longer than half the orbital length; in the greater length of the second anal spine (3.0 in head), and in the development of coarse flat spines along the preopercular margin, of which those at the angle are directed downward.

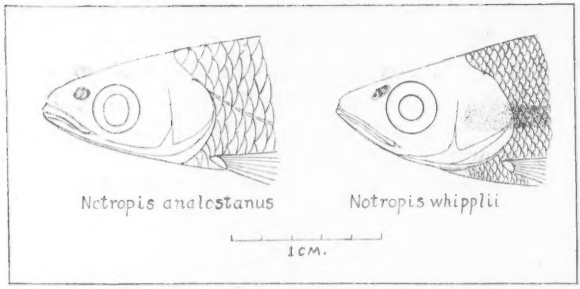
Carl L. Hubbs,
University of Michigan.

A RECORD OF *Notropis whipplii* FROM THE DISTRICT OF COLUMBIA

Three specimens of *Notropis whipplii* were collected by the writer and Mr. C. M. Breder, Jr., of the New York Aquarium, in Oxon Run, a small stream flowing into the Potomac near the southeastern corner of the District of Columbia. One specimen was taken January 1, 1920, and two more were taken October 4, 1920. If this species has been taken in the District, or indeed on the Atlantic slope, previously, the record is not known to the writer.

The range of *Notropis whipplii,* as stated by Jordan and Evermann in Bulletin 47, page 278, is:—"Central New York, Cayuga Lake to Minnesota, northern Alabama and Arkansas, in clear streams; very abundant in the Ohio valley." *N. analostanus,* on page 279, is described as follows:—"The eastern representative of *N. whipplii.* Entirely similar to *whipplii* except that the body is less elongate and the scales larger, 34 or 35 in the lateral line instead of 38 to 40. Probably to be regarded as a different species, but possibly intergrading with *whipplii* on the westward and perhaps with *niveus* southward."

It is evident, therefore, that *N. whipplii* might be confused with *N. analostanus,* but no particular difficulty was experienced in separating the three specimens of the former from a large number of the latter, since the much larger scales and smaller mouth of *N. analostanus* distinguish it at once. In addition, preserved specimens of *N. whipplii* have a much darker stripe along the side than that of *N. analostanus.* When specimens of each, of the same length, are placed side by side, they appear to be quite distinct. The accompanying cut which was drawn from specimens each of which was 55.0 mm. long, illustrates some of the most striking differences between the two species.



Our specimens of *N. analostanus* have 37 scales and those of *N. whipplii* have 42 scales along the lateral line. The scales of the former are much deeper than long, while the scales of the latter have a rounded appearance. The specimens collected in Oxon Run agree closely with the type specimen of *N. whipplii,* (U. S. N. M., No. 137), except that the type has 40 instead of 42 scales.

Since the western range of *N. whipplii* coincides with the range of such minnows as *N. cornutus* and *Semotilus bullaris* which are found also on the Atlantic slope, there is no reason to suppose that *whipplii* is an introduced species, or one that has migrated eastward within recent times. Similarly, *analostanus* might extend farther west than is known at present, not because of intergrading, but because its distribution in the east is similar to that of other minnows which are found both in the east and west. Although *whipplii* apparently is not abundant in Oxon Run, it might be found in many tributaries of the Potomac and no doubt it has been taken by other collectors who have not separated it from *analostanus.*

Notropis analostanus also differs from *N. niveus* with which it is supposed to intergrade to the south. Specimens of *niveus* were compared carefully with specimens of *analostanus* and the type specimen of

whipplii. A brief summary of the more striking characters which follows shows that it is needless to confuse these three species, although superficially they resemble each other in form.

Notropis.

1. Maxillary extending to below middle of nostril. Nostril wholely anterior to the orbit. Lower jaw included. Scales 40-42, rounded in appearance. *niveus.*
2. Maxillary extending nearly to anterior margin of orbit. Lower jaw included. Scales 34-37, much deeper than long. Nostril wholely anterior to the orbit. *analostanus.*
3. Maxillary extending beyond anterior margin of orbit, in some specimens to anterior margin of pupil. Mouth rather oblique, more so than in preceding species. Lower jaw sub-equal, its tip when the mouth is closed even with, or projecting a trifle beyond snout. Scales 40-42, rounded in appearance. Axis of nostril directed obliquely upward. Posterior margin of nostril lies above anterior portion of orbit. *whipplii.*

D. R. Crawford,
U. S. Bureau of Fisheries.

A BASKING SHARK (*Cetorhinus maximus*) OFF NEW JERSEY

On April 26, 1921, an example of this shark was captured by some mackerel-fishermen 65 miles off Atlantic City. It was captured in a purse-net, which it largely destroyed in its struggles. In length it measured about 17 feet. Among some portions of it which we have preserved are a number of the very small teeth, which measure 4 mm. in length.

Henry W. Fowler,
Philadelphia, Pa.

A LIST OF THE LIZARDS COLLECTED BY R. H. BECK IN THE SOUTHERN PACIFIC, NOVEMBER, 1920, TO MAY, 1921

In the course of his work for the Whitney South Sea Expedition of the American Museum of Natural History, Mr. Rollo H. Beck has made a considerable collection of the lizards occurring on the islands visited by him. Six species, of as many genera (three geckos and three skinks) are represented by one-hundred-and-six specimens, from eight islands, collected during the period from November, 1920, to May, 1921.

While no new species are represented, the collection is of especial interest in adding three forms to the known reptile fauna of Christmas Island, and in the definite records from several other islands, from which lizards have not previously been known.

Recent papers on the herpetology of the more eastern Pacific Islands, with the notable exception of that by Stejneger on the Hawaiian reptiles (1899, Proc. U. S. Nat. Mus., XXI, pp. 783-813) consist chiefly of isolated records or of notes on specimens from a single island. Should Mr. Beck be so fortunate as to secure further material from the oceanic islands of the Pacific, a more comprehensive study of the distribution and variation of their scanty reptile fauna will be possible.

A comprehensive account of Christmas Island (Andrews, Charles W., 1900, A Monograph of Christmas Island) contains an account of its reptiles by Dr. G. A. Boulenger, based on several previous collections together with that of Mr. Andrews in 1897-1898. The survey by Andrews was undertaken for the express purpose of ascertaining the status of the fauna before the commercial development of the island by an English company, and I believe we may accept Boulenger's list of 1900 as

complete, at least for all of the conspicuous or abundant forms. The fact that Mr. Beck's collection, obtained some twenty-two years later, contains numerous specimens of *Lepidodactylus lugubris* and a single one each of *Peropus mutilatus* and *Cryptoblepharus poecilopleurus,* all three species widely distributed in Oceania, is fairly conclusive if indirect evidence pointing towards their accidental introduction by human agency.

The list of species and localities follows:—

Lipidodactylus lugubris (Dumeril and Bibron); Christmas Island, 29 specimens; Tahiti, Society Islands, 8 specimens; Tubuai Island, Austral Islands, 1 specimen.

Peropus mutilatus (Wiegmann); Christmas Island, 1 specimen; Tahiti, Society Islands, 1 specimen. Ravaivai Island, Austral Islands, 1 specimen; Remitara Island, Austral Islands, 1 specimen.

Gehyra oceanica (Lesson); Tahiti, Society Islands, 5 specimens; Ravaivai Island, Austral Islands, 1 specimen; Remitara Island, Austral Islands, 4 specimens.

Leiolopisma noctua (Lesson); Tahiti, Society Islands, 7 specimens; Remitara Island, Austral Islands, 3 specimens; Rurutu Island, Austral Islands, 4 specimens; Ravaivai Island, Austral Islands, 3 specimens.

Emoia cyanura (Lesson); Hivaoa Island, Marquesas Islands, 1 specimen; Tahiti, Society Islands, 6 specimens; Remitara Island, Austral Islands, 1 specimen; Rurutu Island, Austral Islands, 6 specimens; Ravaivai Island, Austral Islands, 6 specimens; Tubuai Island, Austral Islands, 5 specimens.

Cryptoblepharus poecilopleurus Wiegmann; Christmas Island, 1 specimen; Rapa Island, 3 specimens; Tahiti, Society Islands, 4 specimens; Remitara Island, Austral Islands, 1 specimen; Tubuai Island, Austral Islands, 3 specimens.

KARL P. SCHMIDT,
New York, N. Y.

INDEX FOR 1921

Abramis crysoleucas, p. 64, 72.
acanthias, Squalus, p. 72.
Achirus fasciatus, p. 68.
Acipenser brevirostrum, p. 62.
Acipenser sturio, p. 62.
Acris gryllus, p. 8, 74.
aestivalis, Pomolobus, p. 63.
Aetobatus narinari, p. 19.
Agkistrodon bloomhoffii, p. 54.
Agkistrodon mokasen, p. 56, 76.
Alectis ciliaris, p. 9.
aleuticus, Cottus, p. 7.
Alosa sapidissima, p. 63.
Ambloplites rupestris, p. 71.
Ambystoma macrodactylum, p. 5.
Ambystoma maculatum, p. 26, 41.
Ambystoma opacum, p. 26.
Ambystoma punctatum, p. 15.
Ameiurus catus, p. 63.
Ameiurus natalis, p. 72.
Ameiurus nebulosus, p. 63.
americana, Morone, p. 68.
americanus, Esox, p. 66.
americanus Hemitripterus, p. 73.
amoena, Carphophis, p. 75.
Amyda spinifera, p. 76.
analis, Caranx, p. 78.
Anchoviella brownii, p. 72.
Anchoviella mitchilli, p. 72.
Anguilla restrata, p. 66.
anogenus, Notropis, p. 70.
anomalum, Campostoma, p. 71.
Apeltes quadracus, p. 66.
Aphredoderus sayanus, p. 66.
arundinum, Cervicapra, p. 34.
asper, Cottus, p. 7.
atherinoides, Notropis, p. 69.
atlanticus, Tarpon, p. 25, 33, 37.
atromaculatus, Semotilus, p. 64.
atronasus, Rhinichthys, p. 65.
atronasus lunatus, Rhinichthys, p. 71.
atrorubens, Sabastodes, p. 27.
atrox, Crotalus, p. 29.
Atsatt, S. R., p. 39.
auratus, Carassius, p. 65.
aureolum, Moxostoma, p. 71.
auriculatus, Sebastodes, p. 28.
auritus, Lepomis, p. 67.
Babcock, H. L., p. 8.
Balistes carolinensis, p. 11.
Barbour, T., p. 33, 44.
bartholomaei, Caranx, p. 45.
Bell, J. C., p. 20.
berus, Vipera, p. 56.
bifrenatus, Notropis, p. 64.
binoculata, Raja, p. 28.
Bishop, S. C., p. 38, 81.
Blanchard, F. N., p. 6.
bloomhoffii, Agkistrodon, p. 53.
Boleichthys fusiformis, p. 68.
Boleosoma nigrum olmstedi, p. 67, 71.
bonasus, Rhinoptera, p. 10.
boops, Selar, p. 78.
boreas boreas, Bufo, p. 6.
bottae, Charina, p. 84.
Breder, C. M., Jr., p. 86.
brevirostrum, Acipenser, p. 62.
brevis, Caranx, p. 78.
Brevoortia tyrannus, p. 18, 63.
Brimley, C. S., p. 27, 32.
brookei, Tropidophorus, p. 42.
brownii, Anchoviella, p. 72.
Bufo boreas boreas, p. 6.
Bufo fowleri, p. 74, 81.
Bufo quercicus, p. 21.
Bufo terrestris, p. 21.
bullaris, Semotilus, p. 63, 88.
callarias, Gadus, p. 73.
Campostoma anomalum, p. 71.
canis, Mustelus, p. 85.
cantabrigensis, Rana, p. 75.
Caranx, p. 78.
Caranx analis, p. 78.
Caranx bartholomaei, p. 45.
Caranx brevis, p. 78.
Caranx crysos, p. 11, 45.
Caranx djeddaba, p. 78.
Caranx guara, p. 45.
Caranx hasselti, p. 78.
Caranx hippos, p. 45.
Caranx kuhli, p. 78.
Caranx latus, p. 45.
Caranx lugubris, p. 45.
Caranx macrurus, p. 78.
Caranx malam, p. 78.
Caranx microchir, p. 78.
Caranx novae-guineae, p. 78.
Caranx para, p. 78.
Caranx plumieri, p. 78.
Caranx ruber, p. 46.
Carassius auratus, p. 65.
Carcharhinus commersonii, p. 17.
Carcharhinus limbatus, p. 18.
Carcharhinus obscurus, p. 72.
Carcharias littoralis, p. 72, 77.
Caretta caretta, p. 18.
carolina, Terrapene, p. 76.
carolinensis, Balistes, p. 11.
carolinensis Gastrophryne, p. 21.
Carphophis amoena, p. 75.
carpio, Cyprinus, p. 65.
cataractae, Rhinichthys, p. 65.
catenatus, Sistrurus, p. 56.
catesbeiana, Rana, p. 39, 74.
Catostomus commersonii, p. 63, 71.
catus, Ameiurus, p. 63.
cayuga, Notropis, p. 70.
centrura, Dasyatis, p. 10, 72.
cepedianum, Dorosoma, p. 62.
Cervicapra arundinum, p. 34.
Cetorhinus maximus, p. 89.
chaetodon, Mesogonistius, p. 67.
chalybaeus, Notropis, p. 65.
Charina bottae, p. 84.
Chilomycterus schoepfii, p. 11, 73.
Chrysemys marginata bellii, p. 6.
Chrysemys marginata marginata, p. 76.
ciliaris, Alectis, p. 9.
cinereus, Plethodon, p. 73.
cirratum, Ginglymostoma, p. 17, 37.
clamitans, Rana, p. 74.
Clemmys insculpta, p. 37.
Coker, R. E., p. 26, 37.
colias, Scomber, p. 73.
Coluber constrictor flaviventris, p. 6, 55.
commersonii, Carcharhinus, p. 17.
commersonii, Catostomus, p. 65, 71.
complanatus, Unio, p. 81.
constrictor flaviventris, Coluber, p. 6, 55.
contortrix, Heterodon, p. 56, 75.
Coregonus coulteri, p. 1.

Coregonus quadrilateralis, p. 2.
cornutus, Notropis, p. 64, 69, 88.
Cottus aleuticus, p. 7.
Cottus asper, p. 7.
Cottus gulosus, p. 7.
coulteri, Coregonus, p. 1.
Crawford, D. R., p. 89.
Crocodilus niloticus, p. 33.
Crotalus atrox, p. 29.
Crotalus horridus, p. 29, 56.
Crotalus oregonus, p. 6.
Crotalus willardi, p. 83.
crucifer, Hyla, p. 74.
Cryptobiepharus poecilopleurus, p. 91.
crysoleucas, Abramis, p. 64, 72.
crysos, Caranx, p. 11, 45.
cyanura, Emoia, p. 91.
Cyprinus carpio, p. 65.
Dasyatis centrura, p. 10, 72.
Decapterus, p. 78.
Deckert, R. F., p. 23.
decurtatus, Phyllorhynchus, p. 39.
denysi, Polypedates, p. 61.
Desmognathus fuscus, p. 80.
Diadophis punctatus edwardsii, p. 75.
diaphanus, Fundulus, p. 66, 71.
djeddaba, Caranx, p. 78.
dolomieu, Micropterus, p. 67.
Dorosoma cepedianum, p. 62.
dubius, Fierasfer, p. 28.
Echeneis naucrates, p. 11.
eglanteria, Raja, p. 10, 72.
Eigenmann, C. H., p. 33.
Elaphe obsoleta, p. 56, 76.
Eleutherodactylus ricordii, p. 22.
emerita, Microhyla, p. 33.
Emoia cyanura, p. 91.
Enneacanthus gloriosus, p. 67.
ephilida, Lachnosterna, p. 81.
Erimyzon sucetta, p. 71.
Erimyzon sucetta oblongus, p. 65.
Esox, p. 11.
Esox americanus, p. 66.
Esox tridecemlineatus, p. 66.
Exoglossum maxillingua, p. 65.
fario, Salmo, p. 63.
fasciatus, Achirus, p. 68.
fasciatus Plestiodon, p. 75.
feriarum, Pseudacris, p. 74.
Fierasfer dubius, p. 28.
Fisher, G. C., p. 24.
flavescens, Perca, p. 11, 12, 67.
fontinalis, Salvelinus, p. 3, 12, 63.
Fowler, H. W., p. 62, 89.
fowleri, Bufo, p. 74, 81.
Fundulus, p. 70.
Fundulus diaphanus, p. 66, 71.
Fundulus heteroclitus macrolepidotus, p. 66, 85.
fuscus, Desmognathus, p. 80.
fusiformis, Boleichthys, p. 68.
Gadus callarias, p. 73.
Galeocerdo tigrinus, p. 18.
Gastrophryne carolinensis, p. 21.
Gehyra oceanica, p. 91.
Genyonemus lineatus, p. 86.
geographica, Graptemys, p. 80.
gibbosus, Pomotis, p. 67, 71.
Ginglymostoma cirratum, p. 17, 57.
gloriosus, Enneacanthus, p. 67.
glutinosus, Plethodon, p. 74.
Graptemys geographica, p. 80.
grayi, Tropidophorus, p. 42.
griseus, Varanus, p. 42.
grylio, Rana, p. 20.
gryllus, Acris, p. 8, 74.
guara, Caranx, p. 45.
Gudger, E. W., p. 57.
gulosus, Cottus, p. 7.
Gyrinophilus porphyriticus, p. 79.
gyrinus, Schilbeodes, p. 63.
hasselti, Caranx, p. 78.
Hemitripterus americanus, p. 73.
heteroclitus macrolepidotus, Fundulus, p. 66, 85.
Heterodon contortrix, p. 56, 75.
heterodon, Notropis, p. 70.
heteropholis, Varanus, p. 43.
hippos, Caranx, p. 45.
holbrookii, Scaphiopus, p. 22.
horridus, Crotalus, p. 29, 56.
Hubbs, C. L., p. 8, 28, 86.
hudsonius, Notropis, p. 69.
hudsonius amarus, Notropis, p. 64.
Huyck, E. N., p. 11.
Hybognathus nuchalis regius, p. 63.
Hybopsis kentuckiensis, p. 71.
Hyla crucifer, p. 74.
Hyla regilla, p. 6.
Hyla squirella, p. 22.
Hyla versicolor, p. 74.
incisor, Lepomis, p.67, 71.
indicus, Varanus, p. 42.
insculpta, Clemmys, p. 37.
insignis, Schilbeodes, p. 63.
irideus, Salmo, p. 63.
Jordan, D. S., p. 28, 36, 79.
Kendall, W. C., p. 4
kentuckiensis, Hybopsis, p. 71.
kuhli, Caranx, p. 78.
Kyphosus sectatrix, p. 9.
Labidesthes sicculus, p. 71.
Lachnosterna ephilida, p. 81.
laevigatus, Lagocephalus, p. 73.
Lampropeltis pyromelaena multicincta, p. 44.
Lampropeltis triangulum, p. 56.
Latham, R., p. 73.
lathami, Trachurus, p. 73.
latus, Caranx, p. 45.
Leiolopisma noctua, p. 91.
Leiostomus xanthurus, p. 10, 73.
Lepidodactylus lugubris, p. 91.
Lepisosteus osseus, p. 62.
Lepomis auritus, p. 67.
Lepomis incisor, p. 67, 71.
Lichanura roseofusca, p. 35.
limbatus, Carcharhinus, p. 18.
lineatus, Genyonemus, p. 86.
lineatus Roccus, p. 68.
Liopeltis vernalis, p. 23.
littoralis, Carcharias, p. 72, 77.
Lophopsetta maculata, p. 11.
lugubris, Caranx, p. 45.
lugubris, Lepidodactylus, p. 91.
McAtee, W. L., p. 40.
macrodactylum, Ambystoma, p. 5.
macrurus, Caranx, p. 78.
maculata, Lophopsetta, p. 11.
maculatum, Ambystoma, p. 26, 41.
maculatus, Spheroides, p. 11.
malam, Caranx, p. 78.
marginata bellii, Chrysemys, p. 6.
marginata marginata, Chrysemys, p. 76.
marina, Strongylura, p. 66.
marinus, Petromyzon, p. 62.
maxillingua, Exoglossum, p. 65.
maximus, Cetorhinus, p. 89.
mediocris, Pomolobus, p. 62.
Megalophrys montana, p. 60.

Mesogonistius chaetodon, p. 67.
Metcalf, Z. P., p. 82.
Microhyla eremita, p. 33.
Microhyla niasensis, p. 33.
Micropogon undulatus, p. 10.
Micropterus, p. 11.
Micropterus dolomieu, p. 67.
Micropterus salmoides, p. 67, 71.
microchir, Caranx, p. 78.
mitchilli, Anchoviella, p. 72.
Mobula, p. 18.
mokasen, Agkistrodon. p, 56, 76.
montana, Megalophrys, p. 60.
mordax, Osmerus, p. 2, 63.
Morone americanus, p. 68.
Moxostoma aureolum, p. 71.
mucosus, Xiphister, p. 36.
multilatus, Peropus, p. 91.
muskoka, Notropis, p. 71.
Mustelus canis, p. 85.
mystax, Polypedates, p. 61.
narinari, Aetobatus, p. 19.
natalis, Ameiurus, p. 72.
Natrix septemvittata, p. 76.
Natrix sipedon, p. 56, 76.
naucrates, Echeneis, p. 11.
nebulosus, Ameiurus, p. 63.
niasensis, Microhyla, p. 33.
Nichols, J. T., p. 11, 20, 46.
nigrum olmstedi, Boleosoma, p. 67, 71.
niloticus, Crocodilus, p. 33.
niloticus Varanus, p. 42.
niveus, Notropis, p. 88.
Noble, G. K., p. 54, 62, 68, 80.
noctua, Leiolonisma, p. 91.
notatus, Pimephales, p. 63, 71.
Notophthalmus viridescens, p. 14, 31.
Notropis anogenus, p. 70.
Notropis atherinoides, p. 69.
Notropis bifrenatus, p. 64.
Notropis cayuga, p. 70.
Notropis chalybaeus, p. 65.
Notropis cornutus, p. 64, 69, 88.
Notropis heterodon, p. 70.
Notropis hudsonius, p. 69.
Notropis hudsonius amarus, p. 64.
Notropis muskoka, p. 71.
Notropis niveus, p. 88.
Notropis photogenis amoenus, p. 65.
Notropis procne, p. 64.
Notropis whipplii analostanus, p. 64, 87.
Notropis whipplii whipplii, p. 87.
novae-guineae, Caranx, p. 78.
nuchalis regius, Hybognathus, p. 63.
obscurus, Carcharhinus, p. 72.
obsoleta, Elaphe, p. 56, 76.
oceanica, Gehyra, p. 91.
ocularis, Pseudacris, p. 22.
Oligodon ornatus, p. 20.
Oligodon rouxi, p. 20.
opacum, Ambystoma, p. 26.
oregonus, Crotalus, p. 6.
orientalis, Triturus, p. 59.
ornatus, Oligodon, p. 20.
Ortenburger, A. I., p. 76, 84.
Osmerus mordax, p. 2, 63.
osseus, Lepisosteus, p. 62.
Otophidium taylori, p. 28.
Palinurichthys perciformis, p. 9.
palustris, Rana, p. 74.
para, Caranx, p. 78.
Perca flavescens, p. 11, 12, 67.
perciformis, Palinurichthys, p. 9.
Peropus multilatus, p. 91.
Petromyzon marinus, p. 62.
photogenis amoenus, Notropis, p. 65.
Phyllodactylus tuberculosus, p. 16.
Phyllorhynchus decurtatus, p. 39.
Pimephales notatus, p. 63, 71.
pipiens, Rana, p. 75.
Pituophis, p. 5.
Plestiodon fasciatus, p. 75.
Plethodon cinereus, p. 73.
Plethodon glutinosus, p. 74.
plumieri, Caranx, p. 78.
poecilopleurus, Cryptoblepharus, p. 91.
politus, Seriphus, p. 86.
Polypedates denysi, p. 61.
Polypedates mystax, p. 61.
Pomolobus aestivalis, p. 63.
Pomolobus mediocris, p. 62.
Pomolobus pseudoharengus, p. 62.
Pomotis gibbosus, p. 67, 71.
Pomoxis sparoides, p. 67.
Pope, P. H., p. 15, 80.
Poronotus triacanthus, p. 10.
porphyriticus, Gyrinophilus, p. 79.
pretiosa pretiosa, Rana, p. 6.
procne, Notropis, p. 64.
Pseudacris feriarum, p. 74.
Pseudacris ocularis, p. 22.
pseudoharengus, Pomolobus, p. 62.
punctatum, Ambystoma, p. 15.
punctatus edwardsii, Diadophis, p. 75.
pygmaea, Umbra, p. 66.
pyromelaena multicincta, Lampropeltis, p. 44.
pyrrhogaster, Triturus, p. 59.
quadracus, Apeltes, p. 66.
quadrilateralis, Coregonus, p. 2.
quercicus, Bufo, p. 21.
Raja binoculata, p. 28.
Raja eglanteria, p. 10, 72.
Rana cantabrigensis, p. 75.
Rana catesbeiana, p. 39, 74.
Rana clamitans, p. 74.
Rana grylio, p. 20.
Rana palustris, p. 74.
Rana pipiens, p. 74.
Rana pretiosa pretiosa, p. 6.
Rana sphenocephala, p. 20, 75.
Raven, H. C., p. 35.
regilla, Hyla. p. 6.
Rhinoptera bonasus, p. 10.
Rhinichthys atronasus, p. 65.
Rhinichthys atronasus lunatus, p. 71.
Rhinichthys cataractae, p. 65.
ricordii, Eleutherodactylus, p. 22.
Ritter, W. E., p. 31.
Roccus lineatus, p. 68.
roseofusca, Lichanura, p. 35.
rostrata, Anguilla, p. 66.
rouxi, Oligodon, p. 20.
ruber, Caranx, p. 45.
rupestris, Ambloplites, p. 71.
Ruthven, A. G., p. 20.
salar, Salmo, p. 63.
Salmo fario, p. 63.
Salmo irideus, p. 63.
Salmo salar, p. 63.
salmoides, Micropterus, p. 67, 71.
salvator, Varanus, p. 42.
Salvelinus fontinalis, p. 3, 12, 63.
sapidissima, Alosa, p. 63.
sauritus, Thamnophis, p. 56, 76.
sayanus, Aphredoderus, p. 66.
Scaphiopus holbrookii, p. 22.
Sceloporus undulatus, p. 75.
Schilbeodes gyrinus, p. 63.
Schilbeodes insignis, p. 63.

Schmidt, K. P., p. 92.
schoepfii, Chilomycterus, p. 11, 73.
Schoonmacher, W. J., p. 38.
Scomber colias, p. 73.
Scombridae, p. 18.
Sebastodes atrorubens, p. 27.
Sebastodes auriculatus, p. 28.
sectatrix, Kyphosus, p. 9.
Selar, p. 77.
Selar boops, p. 78.
Selar torvus, p. 78.
Semotilus atromaculatus, p. 64.
Semotilus bullaris, p. 63, 88.
septemvittata, Natrix, p. 76.
Seriola zonata, p. 9, 10.
Seriphus politus, p. 86.
Sherwood, G. H., p. 77.
sicculus, Labidesthes, p. 71.
sipedon, Natrix, p. 56, 76.
sirtalis, Thamnophis, p. 56.
sirtalis parietalis, Thamnophis, p. 6.
Sistrurus catenatus, p. 56.
Smith, H. M., p. 10.
Smith, L., p. 41, 59.
Snakes swallowing young, p. 51, 54.
sparoides, Pomoxis, p. 67.
Speck, F. G., p. 51.
sphenocephala, Rana, p. 20, 75.
Spheroides maculatus, p. 11.
Sphyrna zygaena, p. 18.
spinifera, Amyda, p. 76.
Squalus acanthias, p. 72.
squirella, Hyla, p. 22.
Stephens, F., p. 16.
Stizostedion vitreum, p. 67.
Storer, T. I., p. 44.
Strongylura marina, p. 66.
sturio, Acipenser, p. 62.
Street, J. F., p. 62.
sucetta, Erimyzon, p. 71.
sucetta oblongus, Erimyzon, p. 65.
Swarth, H. S., p. 83.
Tarpon atlanticus, p. 25, 33, 37.
taylori, Otophidium, p. 28.
Terrapene carolina, p. 76.
terrestris, Bufo, p. 21.
Thamnophis sauritus, p. 56, 76.
Thamnophis sirtalis, p. 56.
Thamnophis sirtalis parietalis, p. 6.
tigrinus, Galeocerdo, p. 18.
Titcomb, J. W., p. 13.
torvus, Selar, p. 78.
Townsend, C. H, p. 11.
Trachurus lathami, p. 73.
Trachurus trachurus, p. 78.
triacanthus, Poronotus, p. 10.
triangulum, Lampropeltis, p. 56.
tridecemlineatus, Esox, p. 66.
Triturus orientalis, p. 59.
Triturus pyrrhogaster, p. 59.
Tropidophorus brookei, p. 42.
Tropidophorus grayi, p. 42.
truncatus, Tursiops, p. 19.
tuberculosus, Phyllodactylus, p. 16.
Tursiops truncatus, p. 19.
tyrannus, Brevoortia, p. 18, 63.
Umbra pygmaea, p. 66.
undulatus, Micropogon, p. 10.
undulatus Sceloporus, p. 75.
Unio complanatus, p. 81.
Varanus griseus, p. 42.
Varanus heteropholis, p. 43.
Varanus indicus, p. 42.
Varanus niloticus, p. 42.
Varanus salvator, p. 42.
vernalis, Liopeltis, p. 23.
versicolor, Hyla, p. 74.
Viper, p. 52.
Vipera berus, p. 56.
viridescens, Notophthalmus, p. 14, 31.
vitreum, Stizostedion, p. 67.
Weed, A. C., p. 72.
whipplii analostanus, Notropis, p. 64, 87.
whipplii whipplii, Notropis, p. 87.
Wilder, H. H., p. 59.
willardi, Crotalus, p. 83.
Wright, A. H., p. 36.
xanthurus, Leiostomus, p. 10, 73.
Xiphidion, p. 36.
Xiphister mucosus, p. 36.
zonata, Seriola, p. 9, 10.
zygaena, Sphyrna, p. 18.

PRICE FIVE CENTS

EDITED by J. T. NICHOLS, American Museum of Natural History